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A New Swimming Crab of the Genus *Carupa* from Submarine Caves in the Ryukyu Islands

By

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Abstract A new species of the genus *Carupa* (Family Portunidae) is described under the name of *C. ohashii* based on the specimens from submarine caves in the Ryukyu Islands. The new species is readily distinguished from the monotypic representative, *C. tenuipes* DANA which is widely distributed in the Indo-West Pacific, by the narrower carapace and the different armature of the anterolateral borders.

Some interesting collections of decapod crustaceans were brought to the author by Dr. I. HAYAMI, Professor of the University of Tokyo and Dr. T. KASE, Senior Curator of the National Science Museum, Tokyo, who are extensively working on the cryptic molluscs living in submarine limestone caves on the fore-reef slopes of some islands of the Ryukyu Islands.

The results of the identification and the consideration of ecological and evolutionary significance will be discussed in due time. In the present short report, only the most conspicuous swimming crab is preliminary described as new to science under the name of *Carupa ohashii*. This new species is very common in some caves of Ie-jima Island close to the Motobu Peninsula of Okinawa-jima Island, and Irabu-jima and Shimoji-shima Islands west of Miyako Island, many specimens being collected with cage traps. The detailed localities are referred to HAYAMI & KASE (1992; p. 1072, fig. 1).

The specimens other than the holotype form the paratypes. All the type specimens are preserved in the National Science Museum, Tokyo (NSMT).

Family Portunidae

Genus *Carupa* DANA, 1851

Carupa ohashii sp. nov.

[Japanese name: Ohashi-karupa-gazami]

(Figs. 1-3)

Material examined. Ie-jima I.—“Small Cave”, 1 ♂ (36.6×25.7 mm), NSMT-Cr 11363, Oct. 13, 1990; 1 juv. ♂ (19.9×17.8 mm), NSMT-Cr 11366, May 25, 1993; 1 ♀ (46.8×32.3 mm), NSMT-Cr 11367, 1 ♂ (23.4×15.7 mm) and 2 ♀♀ (42.5×28.7



Fig. 1. *Carupa ohashii* sp. nov., holotype, male (NSMT-Cr 11362; 47.8 × 33.1 mm).

mm; 27.6 × 18.0 mm), NSMT-Cr 11368, May 26, 1993; 3 ♂♂ (42.5 × 29.0 mm; 31.6 × 22.1 mm; 27.0 × 18.2 mm) and 1 ♀ (39.3 × 27.0 mm), NSMT-Cr 11369, May 28, 1993.

Irabu-jima I.—“Lunch Hole”, 1 ♀ (52.4 × 37.5 mm), NSMT-Cr 11365, June 1, 1992.

Shimoji-shima I.—“Devil’s Palace”, 2 ♀♀ (58.4 × 36.8 mm; 39.0 × 27.2 mm), NSMT-Cr 11364, June 10, 1991. “Witch’s Palace”, 1 ♂ (47.8 × 33.1 mm), holotype, NSMT-Cr 11362, Apr. 14, 1993.

Diagnosis. A *Carupa* species with seven anterolateral teeth being sharp and with fifth anterolateral tooth being the biggest. Dorsal surface of carapace bright brick red and mottled with dark symmetrical bands and spots.

Description of holotype. Carapace narrowly oval or rather oblong hexagonal in its contour, with 1.44 in ratio of breadth/length; serrated antero- and unarmed posterolateral borders subequal in length, and frontorbital border exceeds posterior border by breadth of an orbit. Dorsal surface of carapace smooth, moderately convex in both directions, with indication of gastric, cardiac and branchial regions and with a linear ridge from each last anterolateral tooth; sparse short hairs along frontorbital and anterolateral borders.

Frontal border cut into two by a median, narrow U-shaped sinus, being distinctly isolated from supraorbital angle by a wide bight; each lobe also subdivided into two which are rounded and subequal to each other. Orbit deep, subdorsal in position;

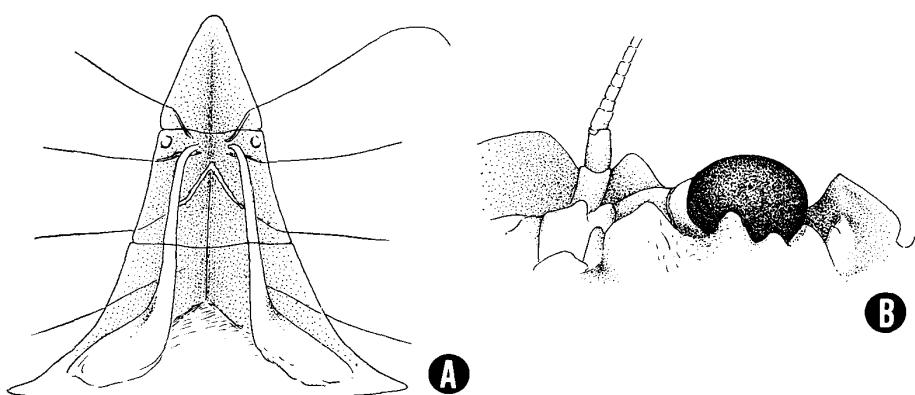


Fig. 2. *Carupa ohashii* sp. nov., holotype, male (NSMT-Cr 11362; 47.8 × 33.1 mm). A: Abdomen and first pleopods *in situ*. B: Left orbital region in ventral view.

supraorbital border thin, with two deep slits, viz., one on its median part and another at base of external orbital tooth; supraorbital angle small, but sharply angulated. Infraorbital border deeply interrupted just below external orbital tooth, armed with three teeth; infraorbital angle prominently sharp and visible from above. Antennal basal segment fills orbital hiatus, being armed with a blunt tubercle at its ventral median part of distal margin; flagellum in orbit, three times as wide as orbit.

Anterolateral border distinctly serrated, with seven sharp teeth including external orbital tooth, which are isolated from each other by six deep notches; external orbital tooth lobular and somewhat different from other teeth, its outer border being subtruncated; following three teeth subequal or sensitively diminish their size posteriorly, and smaller, but sharper than external orbital tooth; following three teeth tipped each with a dark-colored horny tip, their first tooth or the fifth anterolateral tooth being the most prominent of all the anterolateral teeth; their second tooth or the sixth anterolateral tooth distinctly smaller than the preceding and following teeth; last tooth directed obliquely outward, distance between tips of last teeth of both sides being greatest breadth of carapace.

Chelipeds heavy, smooth, different in size. Merus protruded beyond anterolateral border of carapace for its most part, armed with three sharp spines with dark-colored tips on its anterior border. Carpus with two similar spines, viz., one at its inner angle and another on median part of distal margin. Right larger palm inflated, with a longitudinal shallow groove on its outer upper surface; left palm slender, with indistinct groove. Fingers slender in both chelipeds, with some longitudinal linear grooves, distal parts being strongly curved and crossed when closed; cutting edges with interlocked sharp teeth; right larger palm provided with a molar tooth at proximal part of movable finger; both fingers dark-colored on and along teeth and their distal thirds.

Ambulatory legs markedly slender, smooth, unarmed, very scantily hairy on anterior margins of meri and propodi; upper surface of each propodus with a longitudinal groove; dactyli narrow, hairy on both margins, subequal to, or only slightly shorter than propodi.

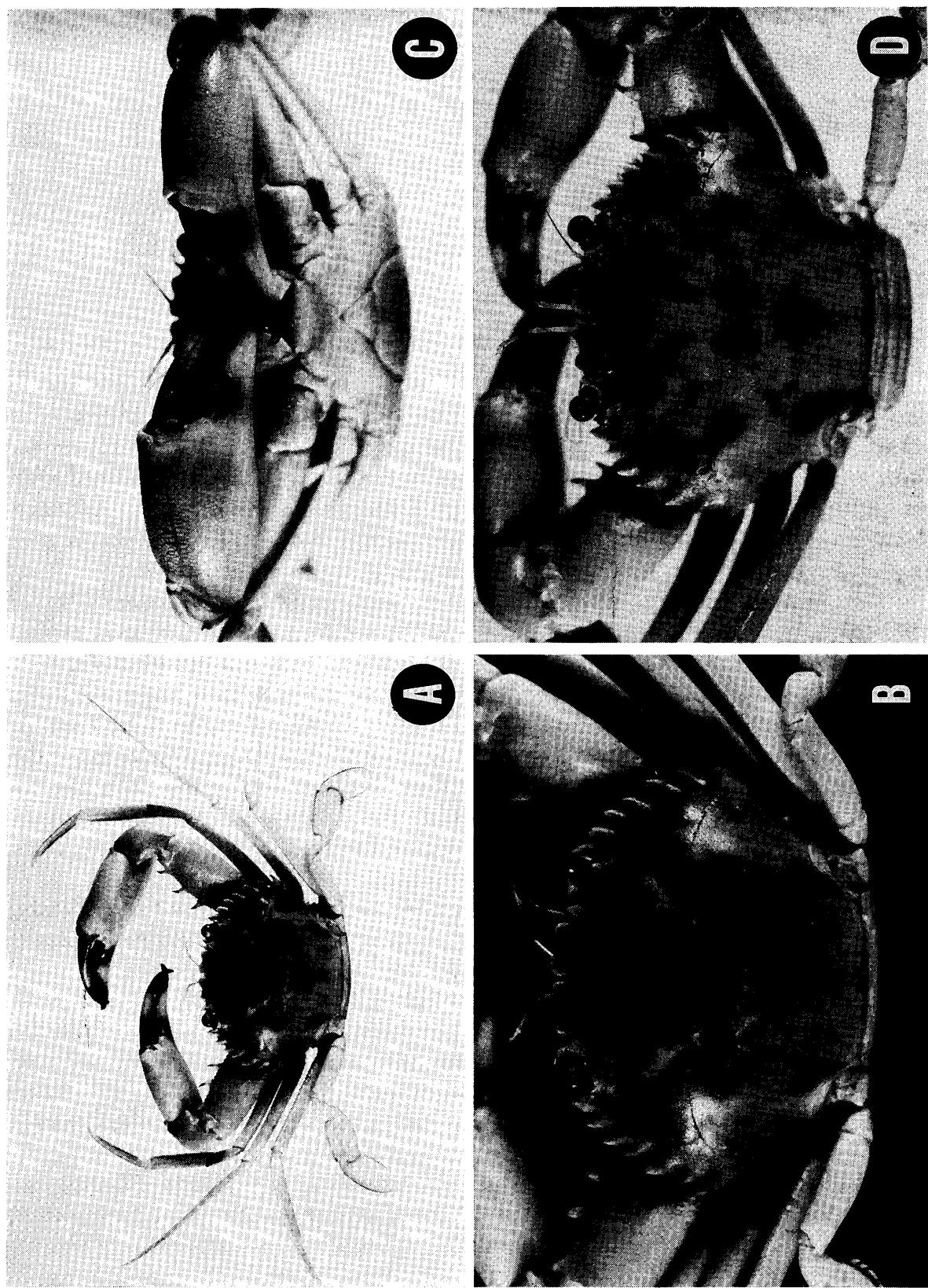


Fig. 3. *Carupa ohashii* sp. nov., paratypes. A-C: Female (NSMT-Cr 11367; 46.8×32.3 mm). D: Female (NSMT-Cr 11365; 52.4×37.5 mm).

Abdomen smooth and composed of four pieces; first segment disguised under carapace for its most part; second to fifth segments completely fused to form one piece, with faint transverse depressions as vestigial indication of segmentation; a short lateral incision between second and third segments; penultimate and terminal segments subequal in length, tapering as a whole. First pleopod slender, straight for its most part, curved inward just near terminal end, attaining tips of fifth sternal sutures *in situ* in abdominal fossa.

Color in life. As reproduced in Fig. 1.

Notes on paratypes. All the paratypes agree very well with the holotype in the general formation of the carapace, chelipeds and ambulatory legs. There may be no need to make mention of the individual variation except for juveniles and youngs in which the color pattern is rather simple and the frontal margin is composed of very low four lobes, with a small median notch and a shallow depression on each lobe. In most of the specimens, the basic color pattern is very similar to that of the holotype.

Remarks. At a first glance, the color pattern of the new species is remarkably different from uniformly reddish *Carupa tenuipes* DANA, 1851, the monotypic representative of the genus, in its chocolate-brown symmetrical bands and spots.

Following the supposition of DE MAN (1888) and KLUNZINGER (1913) that *C. tenuipes* is identical with the immature stage of *C. laeviuscula* HELLER, 1862, LEENE (1940) confirmed their identity and decidedly cancelled the name *C. laeviuscula* for the reason of priority. In the figure of *C. laeviuscula* by HELLER (1865), it is finely figured that the anterolateral teeth are more or less lobular, with the sixth anterolateral tooth being apparently bigger than the others. Although CHEN (1975) dealt both species as distinct, but it is generally considered that both species are conspecific with each other. Otherwise, *C. tenuipes* was figured by the original author in 1855, SAKAI (1939) and EDMONDSON (1954) as *C. laeviuscula*, and LEENE (1940), STEPHENSON & CAMPBELL (1960), CROSNIER (1962), SAKAI (1965, 1976) and DAI & YANG (1991).

Apart from the different color pattern, the new species differs from *C. tenuipes* in many features. Most surprising is the difference in the contour of the carapace including the frontal and anterolateral borders. In the new species the carapace is apparently narrower and hexagonal rather than elliptical because of the last anterolateral teeth of both sides directed obliquely outwards. The front is prominent and distinctly four-lobed, with a median deep and narrow U-shaped sinus. The anterolateral teeth are remarkably sharp, and last three teeth are armed each with a dark-colored horny tip; fifth tooth the strongest instead of the sixth in *C. tenuipes*. The male first pleopod is slender, straight and curved just near the terminal end.

The new species is the second in the genus *Carupa*.

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